

**METHOD AND APPARATUS FOR READING  
REPORTER LABELED BEADS**

**Abstract of the Disclosure**

Combinatorially-synthesized deoxyribonucleic acid (DNA) oligonucleotides  
5 attached to encoded beads that are hybridized to amplified and labeled genomic DNA  
or ribonucleic acid (RNA) are analyzed using a flow imaging system. Oligonucleotides  
and corresponding reporters are bound to the surfaces of a plurality of small beads such  
that different beads bear different oligo sequences. Each bead bears a unique optical  
signature comprising a predefined number of unique reporters, where each reporter  
10 comprises a predefined combination of different fluorochromes. The composite  
spectral signature in turn identifies the unique nucleotide sequence of its attached oligo  
chains. This optical signature is rapidly decoded using an imaging system to  
discriminate the different reporters attached to each bead in a flow in regard to color  
and spatial position on the bead.